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PowerConnect B-8000

Hardware Reference Manual

53-1001788-01

Notes, Cautions, and Warnings

NOTE
A NOTE indicates important information that helps you make better use of your computer.

CAUTION
See the safety and regulatory information that shipped with your system. For additional regulatory information, see the Regulatory Compliance Homepage on www.dell.com at the following location: www.dell.com/regulatory_compliance.

CAUTION
A CAUTION indicates potential damage to hardware or loss of data if instructions are not followed.

DANGER
A DANGER indicates a potential for property damage, personal injury, or death.

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Regulatory Model Codes: Brocade DCX-4S, Brocade DCX

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How this document is organized

This document is organized to help you find the information that you want as quickly and easily as possible.

The document contains the following components:

- Chapter 1, "PowerConnect B-8000 Introduction" provides an overview of the Brocade 8000 switch, a feature list, and a look at the appearance of the switch.
- Chapter 2, "PowerConnect B-8000 Installation and Configuration" provides the information needed to install the switch into your network.
- Chapter 3, "PowerConnect B-8000 Operation" discusses the day-to-day operational procedures for using the switch.
- Chapter 4, "Removal and Replacement Procedures (RRPs)" provides procedures for removing and replacing the field-replaceable units (FRUs).
- Appendix A, "PowerConnect B-8000 Specifications" provides tables of physical, environmental, and general specifications, helpful for quick lookup.
- The Index points you to the exact pages on which specific information is located.

Supported hardware and software

Although many different software and hardware configurations are tested and supported by Brocade Communications Systems, Inc. for Fabric OS v6.1.0, documenting all possible configurations and scenarios is beyond the scope of this document.

This document is specific to the Brocade 8000, Fabric OS v6.1.2_cee and Fabric OS 6.3.0. To obtain information about a Fabric OS version other than v6.1.2_cee or 6.3.0, see the documentation specific to that OS version.

Fabric OS v6.1.2_cee supports only the full Brocade 8000 FCoE switch. With FOS 6.3.0 the Brocade 8000 can be purchased as a base CEE switch and upgraded to a full FCoE switch using the CNVSVC license. The license will enable the FCoE capabilities and enable the FC ports.

What's new in this document

Information about the PowerConnect B-8000 CEE-only platform and licensing information for upgrading from CEE-only to the full FCoE switch has been added. Information about an additional FOS release that supports the switch has been added as well.

Document conventions

This section describes text formatting conventions and important notice formats used in this document.

Text formatting

The narrative-text formatting conventions that are used are as follows:

bold text	Identifies command names Identifies the names of user-manipulated GUI elements Identifies keywords and operands Identifies text to enter at the GUI or CLI
italic text	Provides emphasis Identifies variables Identifies paths and Internet addresses Identifies document titles
`code` text	Identifies CLI output Identifies command syntax examples

For readability, command names in the narrative portions of this guide are presented in mixed lettercase: for example, switchShow. In actual examples, command lettercase is often all lowercase. Otherwise, this manual specifically notes those cases in which a command is case sensitive.

Command syntax conventions

Command syntax in this manual follows these conventions:

command	Commands are printed in bold.
--option, option	Command options are printed in bold.
-**argument,** arg	Arguments.

[ ]	Optional element.
variable	Variables are printed in italics. In the help pages, values are underlined or enclosed in angled brackets < >.
...	Repeat the previous element, for example “member[;member...]”
value	Fixed values following arguments are printed in plain font. For example, **--show** WWN
|	Boolean. Elements are exclusive. Example: **--show -mode** egress | ingress

Notes, cautions, and warnings

The following notices and statements are used in this manual. They are listed below in order of increasing severity of potential hazards.

NOTE
A note provides a tip, guidance or advice, emphasizes important information, or provides a reference to related information.

ATTENTION
An Attention statement indicates potential damage to hardware or data.

CAUTION
A Caution statement alerts you to situations that can be potentially hazardous to you.

DANGER
A Danger statement indicates conditions or situations that can be potentially lethal or extremely hazardous to you. Safety labels are also attached directly to products to warn of these conditions or situations.

Key terms

For definitions specific to Brocade and Fibre Channel, see the *Brocade Glossary*.

For definitions of SAN-specific terms, visit the Storage Networking Industry Association online dictionary at:

http://www.snia.org/education/dictionary

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Additional information

This section lists additional Brocade and industry-specific documentation that you might find helpful.

Brocade resources

To get up-to-the-minute information, join Brocade Connect. It's free! Go to *http://www.brocade.com* and click **Brocade Connect** to register at no cost for a user ID and password.

For practical discussions about SAN design, implementation, and maintenance, you can obtain *Building SANs with Brocade Fabric Switches* through:

http://www.amazon.com

For additional Brocade documentation, visit the Brocade SAN Info Center and click the Resource Library location:

http://www.brocade.com

Release notes are available on the Brocade Connect Web site and are also bundled with the Fabric OS firmware.

Other industry resources

- White papers, online demos, and data sheets are available through the Brocade Web site at *http://www.brocade.com/products/software.jhtml*.
- Best practice guides, white papers, data sheets, and other documentation is available through the Brocade Partner Web site.

For additional resource information, visit the Technical Committee T11 Web site. This Web site provides interface standards for high-performance and mass storage applications for Fibre Channel, storage management, and other applications:

http://www.t11.org

For information about the Fibre Channel industry, visit the Fibre Channel Industry Association Web site:

http://www.fibrechannel.org

Getting technical help

Contact your switch support supplier for hardware, firmware, and software support, including product repairs and part ordering. To expedite your call, have the following information available:

1. General Information
    - Switch model
    - Switch operating system version
    - Error numbers and messages received
    - **supportSave** command output

- Detailed description of the problem, including the switch or fabric behavior immediately following the problem, and specific questions
- Description of any troubleshooting steps already performed and the results
- Serial console and Telnet session logs
- syslog message logs

2. Switch Serial Number

   The switch serial number and corresponding bar code are provided on the serial number label, as illustrated below.:

   ```
   *FT00X0054E9*
   FT00X0054E9
   ```

   The serial number label is located as follows:

   - *PowerConnect B-200E*—On the non-port side of the chassis
   - *PowerConnect B-300, 4100, 4900, 5100, 5300, 7500, 8000, and Brocade Encryption Switch*—On the switch ID pull-out tab located inside the chassis on the port side on the left
   - *PowerConnect B-5000*—On the switch ID pull-out tab located on the bottom of the port side of the switch
   - *PowerConnect B-7600*—On the bottom of the chassis
   - *PowerConnect B-48000*—Inside the chassis next to the power supply bays
   - *PowerConnect B-DCX*—On the bottom right on the port side of the chassis

3. World Wide Name (WWN)

   Use the **wwn** command to display the switch WWN.

   If you cannot use the **wwn** command because the switch is inoperable, you can get the WWN from the same place as the serial number, except for the PowerConnect B-DCX. For the PowerConnect B-DCX, access the numbers on the WWN cards by removing the Brocade logo plate at the top of the non-port side of the chassis.

Document feedback

Quality is our first concern at Brocade and we have made every effort to ensure the accuracy and completeness of this document. However, if you find an error or an omission, or you think that a topic needs further development, we want to hear from you. Forward your feedback to:

documentation@brocade.com

Provide the title and version number of the document and as much detail as possible about your comment, including the topic heading and page number and your suggestions for improvement.

Chapter

PowerConnect B-8000 Introduction

1

In this chapter

- PowerConnect B-8000 overview 1
- Port side of the PowerConnect B-8000 3
- Non-port side of the PowerConnect B-8000 4

PowerConnect B-8000 overview

The PowerConnect B-8000 is a 24-port 10 GbE line-rate, low latency lossless Converged Enhanced Ethernet (CEE) and an 8-port auto-sensing 1, 2, 4, or 8 Gbps Fibre Channel (FC) switch that delivers the latest Brocade ASIC technology and architecture for Fibre Channel Storage Area Networks (SANs). The fully-configured PowerConnect B-8000 enables the Fibre Channel over Ethernet (FCoE) protocol and is a high performance 8 Gbps Fibre Channel switch designed for the needs of enterprise environments that require a high-port footprint for port aggregation and desire the simplified management environment that comes with reducing the total number of domains to manage.

The PowerConnect B-8000 is also available as a CEE-only base model switch with no FC capability. The CEE-only switch can later be upgraded to full FCoE configuration with the purchase of an additional license. This version of the switch is available only with Fabric OS v6.3.0.

The PowerConnect B-8000 supplies Reliability, Availability, and Serviceability (RAS) performance and scalability requirements of an enterprise switch along with the interoperability and ease-of-use advantages found only in the Brocade product family.

Platform components and capabilities

The PowerConnect B-8000 offers the following features and capabilities:

- A system motherboard that features a Freescale MPC8548 Reduced Instruction Set Computer (RISC) CPU running at 1.3 GHz with integrated peripherals, and that provides high performance with low power consumption.
- An RJ45 Ethernet management port, in conjunction with EZSwitchSetup, that supports switch IP address discovery and configuration, eliminating the need to attach a serial cable to configure the switch IP address and greatly increasing the ease of use.
- A USB port that provides storage for firmware updates, output of the **supportSave** command and storage for configuration uploads and downloads.
- Two hot-swappable, redundant power supply FRUs.
- Three hot-swappable fan assembly FRUs in an N+1 configuration to provide hardware-redundant cooling.

- Rack-mount design (1U form factor) using existing rail kits (fixed and mid-mount/Telco rail kits) on a 19-inch EIA rack.
- Extensive diagnostics and system-monitoring capabilities for enhanced high Reliability, Availability, and Serviceability (RAS).
- The Brocade EZSwitchSetup wizard that makes SAN configuration a three-step point-and-click task.
- FCoE to FC latency of 1670 nanoseconds.

FCoE and Layer 2 capabilities

The PowerConnect B-8000 has the following capabilities for the Ethernet functions:

- 24 ports 10 GbE CEE.
- Low latency, lossless, deterministic interconnect required for FCoE.
- FCoE support along with Fabric Provided MAC Address (FPMA) discovery. FOS delivers these features and also enables support for Priority-based Flow Control (802.1Qbb). Data Center Bridging eXchange (DCBX) - Capabilities Exchange and Enhanced Transmission Selection (802.1Qaz) delivers the lossless and deterministic FCoE requirement.
- Enables hardware-assisted MAC learning and aging.
- Support for 32K MAC addresses and 4K Vlans.
- Support for Layer 2 protocols STP/MSTP/RSTP (802.1q) and Link Aggregation (802.1ad).
- Brocade 10G SFP+ (SR and LR) and Brocade-branded Twinax copper cables.
- CEE port to CEE port latency of 570 nanoseconds (same ASIC) and 1050 nanoseconds (different ASIC).

Fibre Channel capabilities

The fully-configured PowerConnect B-8000 offers the following features for the Fibre Channel functions (license required):

- Up to 8 auto-sensing ports of high-performance 8 Gbps technology in a single domain.
- Full 1:1 subscription on 8 Gbps ports.
- 1, 2, 4, and 8 Gbps auto-sensing Fibre Channel switch and router ports.
- Universal ports self-configure as E, F, M, or FL ports.
- Inter-Switch Link (ISL) Trunking (licensable), which allows up to eight ports (at 1, 2, 4, or 8 Gbps speeds) between a pair of switches combined to form a single, logical ISL with a speed of up to 64 Gbps (128 Gbps full duplex) for optimal bandwidth utilization and load balancing.
- Dynamic Path Selection (DPS), which optimizes fabric-wide performance and load balancing by automatically routing data to the most efficient available path in the fabric.
- Brocade-branded SFP optical transceivers that support any combination of Short Wavelength (SWL) and Long Wavelength (LWL) optical media among the switch ports.
- Support for unicast, multicast (255 groups), and broadcast data traffic types.

- Brocade FOS, which delivers distributed intelligence throughout the network and enables a wide range of value-added applications including Brocade Advanced Web Tools and Brocade Zoning. Optional Fabric Services include: Adaptive Networking with QoS, Brocade Extended Fabrics, Brocade Enhanced Group Management, Brocade Fabric Watch, ISL Trunking, and End-to-End Performance Monitoring (APM).
- Port-to-port latency minimized to 700 nanoseconds through the use of cut-through frame routing at 8 Gbps.

Port side of the PowerConnect B-8000

The port side of the PowerConnect B-8000 includes the system status LED, console port, Ethernet port and LEDs, USB port, GbE ports, and Fibre Channel ports and the corresponding port status LEDs.

Figure 1 shows the port side of the PowerConnect B-8000.

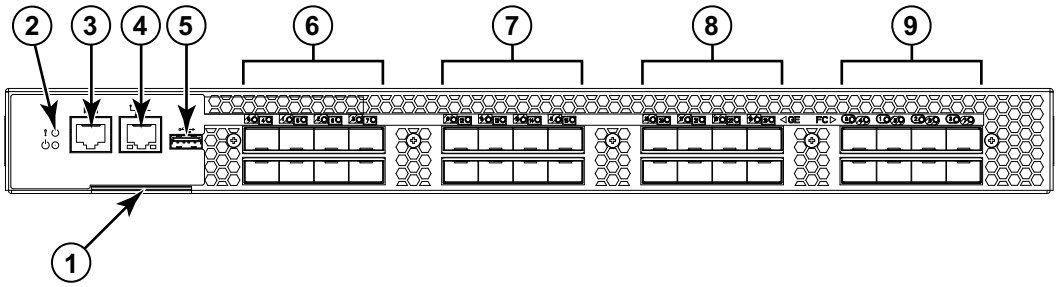

FIGURE 1 Port side view of the PowerConnect B-8000

1	Switch ID pull-out tab	5	USB port
2	System status LED (top) System power LED (bottom)	6	GbE ports 0-7
		7	GbE ports 8-15
3	Serial console port	8	GbE ports 16-23
4	Management Ethernet port	9	FC ports 0-7

Non-port side of the PowerConnect B-8000

Figure 2 shows the non-port side of the PowerConnect B-8000, which contains the power supplies (including the AC power receptacle and AC power switch) and fans.

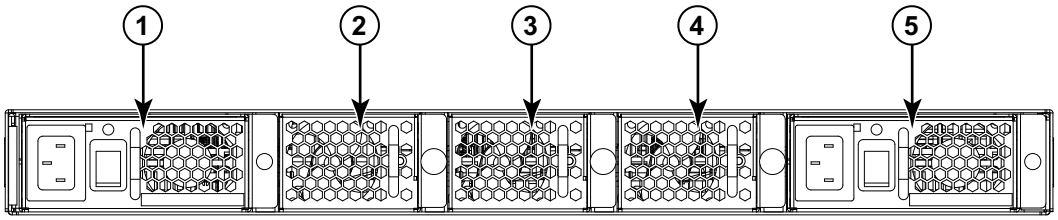

FIGURE 2 Non-port side of the PowerConnect B-8000

1	Power supply #2	4	Fan assembly #1
2	Fan assembly #3	5	Power supply #1
3	Fan assembly #2		

Chapter

PowerConnect B-8000 Installation and Configuration 2

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- Installation and safety considerations 5
- Standalone installation for a PowerConnect B-8000 7
- Cabinet installation for a PowerConnect B-8000 8
- PowerConnect B-8000 configuration 8

Items included with the PowerConnect B-8000

The following items are included with the standard shipment of a fully-configured, FCoE-capable PowerConnect B-8000. When you open the PowerConnect B-8000 packaging, verify that these items are included in the package and that no damage has occurred during shipping:

- The PowerConnect B-8000 switch, containing three fan assemblies and two power supplies
- Eight 8 Gbps SWL SFP+ modules for the Fibre Channel ports
- One accessory kit, containing the following items:
  - Serial cable with an RJ45 connector
  - 6 ft. Power Cord
  - Rubber feet, required for setting up the switch as a standalone unit
  - Brocade Family Doc CD
  - *Powerconnect B-8000 QuickStart Guide*
  - EZSwitch Setup CD

If you have ordered the CEE-only, base model PowerConnect B-8000, all the above items are included *except* the eight SFP+ modules. These can be obtained later if you choose to purchase the XBR-CNVSVC-0001 license to upgrade the switch to full FCoE functionality.

Installation and safety considerations

You can install the PowerConnect B-8000 switch in the following ways:

1. As a standalone unit on a flat surface.
2. In an EIA cabinet using a fixed-rail rack mount kit. The optional fixed-rail rack mount kit can be ordered from your switch retailer.
3. In an EIA cabinet using an optional mid-mount rack kit for switches. The optional mid-mount rack kit for switches can be ordered from your switch retailer.

Electrical considerations

To install and operate the switch successfully, ensure the following:

- The primary outlet is correctly wired, protected by a circuit breaker, and grounded in accordance with local electrical codes.
- The supply circuit, line fusing, and wire size are adequate, as specified by the electrical rating on the switch nameplate.
- The power supply standards provided in Table 8, "Power Supply Specifications" are met.

Environmental considerations

For successful installation and operation of the switch, ensure that the following environmental requirements are met:

- At a minimum, adequate cooling requires that you install the switch with the non-port side, which contains the air intake vents, facing the cool-air aisle.
- All equipment in the rack should force air in the same direction to avoid intake of exhaust air.
- A maximum of 102 cubic meters/hour (60 cubic feet/minute) and a minimum of 74.8 cubic meters/hour (44 cubic feet/minute) of air flow is available to the air intake vents on the non-port side of the switch.
- The ambient air temperature does not exceed 40° C (104° F) while the switch is operating.

Cabinet considerations

For successful installation and operation of the switch in a cabinet, ensure the following cabinet requirements are met:

- The cabinet must be a standard EIA cabinet.
- A cabinet space that is one rack unit (1U) high; 4.45 cm (1.75 inches) high and 48.3 cm (19 inches) wide.
- The equipment in the cabinet is grounded through a reliable branch circuit connection and maintain ground at all times. Do not rely on a secondary connection to a branch circuit, such as a power strip.
- Airflow and temperature requirements are met on an ongoing basis, particularly if the switch is installed in a closed or multicabinet assembly.
- The additional weight of the switch does not exceed the cabinet's weight limits or unbalance the cabinet in any way.
- The cabinet is secured to ensure stability in case of unexpected movement, such as an earthquake.

Recommendations for cable management

The minimum bend radius for a 50 micron cable is 2 inches under full tensile load and 1.2 inches with no tensile load.

Cables can be organized and managed in a variety of ways, for example, using cable channels on the sides of the cabinet or patch panels to minimize cable management. Following is a list of recommendations:

NOTE
You should not use tie wraps with optical cables because they are easily overtightened and can damage the optic fibers.

- Plan for rack space required for cable management before installing the switch.
- Leave at least 1 m (3.28 ft) of slack for each port cable. This provides room to remove and replace the switch, allows for inadvertent movement of the rack, and helps prevent the cables from being bent to less than the minimum bend radius.
- If you are using Brocade ISL Trunking, consider grouping cables by trunking groups. The cables used in trunking groups must meet specific requirements, as described in the *Fabric OS Administrator's Guide*.
- For easier maintenance, label the fiber optic cables and record the devices to which they are connected.
- Keep LEDs visible by routing port cables and other cables away from the LEDs.
- Use hook and loop style straps to secure and organize fiber optic cables.

Items required for installation

The following items are required for installing, configuring, and connecting the PowerConnect B-8000 for use in a network and fabric:

- Workstation with an installed terminal emulator, such as HyperTerminal
- Unused IP address and corresponding subnet mask and gateway address
- Serial cable (provided)
- Ethernet cable
- SFPs and/or Brocade-branded SFP+s (both FC and CEE 10GbE) and compatible cables (Brocade-branded FC SFP+s required for 8 Gbps performance, copper cables must be Brocade-branded), as required (FC SFP+ modules are shipped only with FC Ports on Demand licensing)
- Access to an FTP server for backing up the switch configuration (optional)

Standalone installation for a PowerConnect B-8000

Perform this task to install the PowerConnect B-8000 as a standalone unit.

1. Unpack the PowerConnect B-8000 and verify the items listed on "Items included with the PowerConnect B-8000" on page 5. Verify the items are present and undamaged.
2. Apply the adhesive rubber feet. Applying the rubber feet onto the switch helps prevent the switch from sliding off the supporting surface.

a. Clean the indentations at each corner of the bottom of the switch to ensure that they are free of dust or other debris that might lessen the adhesion of the feet.

b. With the adhesive side against the chassis, place one rubber foot in each indentation and press into place.

3. Place the switch on a flat, sturdy surface.

4. Provide power to the switch as described in "Providing power to the switch" on page 8.

ATTENTION
Do not connect the switch to the network until the IP address is correctly set. For instructions on how to set the IP address, see "PowerConnect B-8000 configuration"

Cabinet installation for a PowerConnect B-8000

Follow the installation instructions shipped with the appropriate rack mount kit:

- To install the switch into a fixed-rail rack, refer to the *Fixed Rack Mount Kit Installation Procedure*.
- To install the switch into mid-mount rack, refer to the *Mid-Mount Rack Mount Kit (Switch) Installation Procedure*.

PowerConnect B-8000 configuration

Once you have set up the PowerConnect B-8000 in a rack or as a standalone switch, it is time to give it power and a basic configuration. If you are going to use the PowerConnect B-8000 in a single-switch setup, you can use EZSwitchSetup to complete the basic configuration.

See the *EZSwitchSetup CD*, included with the PowerConnect B-8000, for more information. You can also use the PowerConnect B-8000 *Quick Start Guide*.

If you do not want to use EZSwitch Setup, follow the instructions in the rest of this section.

NOTE
The required configuration must be done from the Fibre Channel side. There are no specific instructions for configuring the CEE side of the switch.

Providing power to the switch

Perform the following steps to provide power to the PowerConnect B-8000.

1. Connect the power cords to both power supplies, and then to power sources on separate circuits to protect against AC failure. Ensure that the cords have a minimum service loop of 6 in. available and are routed to avoid stress.

2. Power on the power supplies by flipping both AC switches to the "I" symbol. The power supply LEDs display amber until POST is complete, and then change to green. The switch usually requires several minutes to boot and complete POST.

ATTENTION
Power is supplied to the switch as soon as the first power supply is connected and turned on.

3. After POST is complete, verify that the switch power and status LEDs on the left of the port side of the switch are green. See Figure 3 for the specific location of these LEDs.

Creating a serial connection

You will perform all configuration tasks in this guide using a serial connection.

Complete the following steps to create a serial connection to the switch.

1. Connect the serial cable to the serial port on the switch and to an RS-232 serial port on the workstation.

   If the serial port on the workstation is RJ45 instead of RS-232, remove the adapter on the end of the serial cable and insert the exposed RJ45 connector into the RJ45 serial port on the workstation.

2. Open a terminal emulator application (such as HyperTerminal on a PC, or TERM, TIP, or Kermit in a UNIX environment), and configure the application as follows:

   - In a Windows environment:

Parameter	Value
Bits per second	9600
Databits	8
Parity	None
Stop bits	1
Flow control	None

   - In a UNIX environment using TIP, enter the following string at the prompt:

     `tip /dev/ttyb -9600.`

     If ttyb is already in use, use `ttya` instead and enter the following string at the prompt:

     `tip /dev/ttya -9600`

Switch IP address

You can configure the PowerConnect B-8000 with a static IP address, or you can use a DHCP (Dynamic Host Configuration Protocol) server to set the IP address of the switch. DHCP is enabled by default. The PowerConnect B-8000 supports both IPv4 and IPv6.

Using DHCP to set the IP address

When using DHCP, the PowerConnect B-8000 obtains its IP address, subnet mask, and default gateway address from the DHCP server. The DHCP client can only connect to a DHCP server that is on the same subnet as the switch. If your DHCP server is not on the same subnet as the PowerConnect B-8000, use a static IP address.

Setting a static IP address

1. Log into the switch using the default password, which is password.
2. Use the **ipaddrset** command to set the Ethernet IP address.

   If you are going to use an IPv4 IP address, enter the IP address in dotted decimal notation as prompted.

   ```
   Ethernet IP Address: [192.168.74.102]
   ```

   If you are going to use an IPv6 address, enter the network information in semicolon-separated notation as prompted.

   ```
   switch:admin> ipaddrset -ipv6 --add 1080::8:800:200C:417A/64
   IP address is being changed...Done.
   ```

3. Complete the rest of the network information as prompted.

   ```
   Ethernet Subnetmask: [255.255.255.0]
   Ethernet IP Address: [192.168.74.102]
   Ethernet Subnetmask: [255.255.255.0]
   ```

4. Enter off to Disable DHCP when prompted.

   ```
   DHCP [OFF]: off
   ```

Date and time settings

The PowerConnect B-8000 maintains the current date and time inside a battery-backed real-time clock (RTC) circuit. Date and time are used for logging events. Switch operation does not depend on the date and time; a PowerConnect B-8000 with an incorrect date and time value still functions properly. However, because the date and time are used for logging, error detection, and troubleshooting, you should set them correctly.

Time zones

You can set the time zone for the switch by name. You can also set country, city or time zone parameters.

If the time zone is not set with the new options, the switch retains the offset time zone settings. The **tsTimeZone** command includes an option to revert to the prior time zone format. For more information about the **--old** option, see the *Fabric OS Command Reference*.

You can set the time zone for a switch using the **tsTimeZone** command. The **tsTimeZone** command allows you to perform the following tasks:

- Display all of the time zones supported in the firmware
- Set the time zone based on a country and city combination or based on a time zone ID such as PST

The time zone setting has the following characteristics:

- You can view the time zone settings. However, only those with administrative permissions can set the time zones.
- The **tsTimeZone** setting automatically adjusts for Daylight Savings Time.
- Changing the time zone on a switch updates the local time zone setup and is reflected in local time calculations.

- By default, all switches are in the GMT time zone (0,0). If all switches in a fabric are in one time zone, it is possible for you to keep the time zone setup at the default setting.
- System services that have already started will reflect the time zone changes only after the next reboot.
- Time zone settings persist across failover for high availability.

Local time synchronization

You can synchronize the local time of the principal or primary fabric configuration server (FCS) switch to a maximum of eight external network time protocol (NTP) servers. To keep the time in your SAN current, it is recommended that the principal or primary FCS switch has its time synchronized with at least one external NTP server. The other switches in the fabric will automatically take their time from the principal or primary FCS switch.

All switches in the fabric maintain the current clock server value in non-volatile memory. By default, this value is the local clock server <LOCL> of the principal or primary FCS switch. Changes to the clock server value on the principal or primary FCS switch are propagated to all switches in the fabric.

When a new switch enters the fabric, the time server daemon of the principal or primary FCS switch sends out the addresses of all existing clock servers and the time to the new switch. If a switch with v5.3.0 or later has entered the fabric it will be able to store the list and the active servers; pre-5.3.0 Fabric OS switches will ignore the new list parameter in the payload and will update only the active server address.

If the active NTP server configured is IPv6, then distributing the same in the fabric will not be possible to switches earlier than v5.3.0 because IPv6 is supported for Fabric OS version 5.3.0 and later. The default value LOCL will be distributed to pre-5.3.0 switches.

The **tsClockServer** command accepts multiple server addresses in either IPv4, IPv6, or DNS name formats. When multiple NTP server addresses are passed, **tsclockserver** sets the first obtainable address as the active NTP server. The rest are stored as backup servers that can take over if the active NTP server fails. The principal or primary FCS switch synchronizes its time with the NTP server every 64 seconds.

Setting the date

1. Log into the switch using the default password, which is password.
2. Enter the **date** command, using the following syntax:

   date "mmddHHMMyy"

   The values are:

   - mm is the month; valid values are 01 through 12.
   - dd is the date; valid values are 01 through 31.
   - HH is the hour; valid values are 00 through 23.
   - MM is minutes; valid values are 00 through 59.
   - yy is the year; valid values are 00 through 99 (values greater than 69 are interpreted as 1970 through 1999, and values less than 70 are interpreted as 2000-2069).

     ```
     switch:admin> date
     Fri Sep 29 17:01:48 UTC 2007
     switch:admin> date "0927123007"
     ```

```
Thu Sep 27 12:30:00 UTC 2007
switch:admin>
```

Setting time zones

You must perform the procedure on *all* switches for which the time zone must be set. However, you only need to set the time zone once on each switch, because the value is written to nonvolatile memory.

Use one of the two following procedures to set the time zone. The first procedure requires you to select the actual time zone and the second requires you to select the country location of the switch.

The following procedure describes how to set the current time zone using timezone_fmt mode to Central Standard time.

1. Log into the switch using the default password, which is password.
2. Enter the **tsTimeZone** command as follows:

   ```
   switch:admin> tstimezone [--interactive]/ [, timezone_fmt]
   ```

   Use **timezone_fmt** to set the time zone by Country/City or by time zone ID, such as PST.

   The following example shows how to change the time zone to US/Central.

   ```
   switch:admin> tstimezone
   Time Zone : US/Pacific
   switch:admin> tstimezone US/Central
   switch:admin> tstimezone
   Time Zone : US/Central
   ```

The following procedure describes how to set the current time zone using interactive mode to Pacific Standard Time.

1. Type the **tsTimeZone** command as follows:

   ```
   switch:admin> tstimezone --interactive
   ```

2. You are prompted to select a general location.

   ```
   Please identify a location so that time zone rules can be set correctly.
   ```

3. Enter the appropriate **number** or **Ctrl-D** to quit.
4. At the prompt, select a **country location**.
5. At the prompt, enter the appropriate **number** to specify the time zone region or **Ctrl-D** to quit.

Synchronizing local time using NTP

Perform the following steps to synchronize the local time using NTP.

1. Log into the switch using the default password, which is password.
2. Enter the **tsClockServer** command:

   ```
   switch:admin> tsclockserver "<ntp1;ntp2>"
   ```

where *ntp1* is the IP address or DNS name of the first NTP server, which the switch must be able to access. The value *ntp2* is the name of the second NTP server and is optional. The entire operand "<*ntp1;ntp2*>" is optional; by default, this value is LOCL, which uses the local clock of the principal or primary switch as the clock server.

```
switch:admin> tsclockserver
LOCL
switch:admin> tsclockserver "132.163.135.131"

switch:admin> tsclockserver
132.163.135.131
switch:admin>
```

The following example shows how to set up more than one NTP server using a DNS name:

```
switch:admin> tsclockserver "10.32.170.1;10.32.170.2;ntp.localdomain.net"
Updating Clock Server configuration...done.
Updated with the NTP servers

Changes to the clock server value on the principal or primary FCS switch are
propagated to all switches in the fabric.
```

Brocade Inter-Switch Link (ISL) Trunking

Brocade ISL Trunking is optional software that allows you to create trunking groups of ISLs between adjacent switches. ISL trunking is only available if an FC Ports on Demand license has been purchased. Up to eight FC ports on the PowerConnect B-8000 can be used as a trunking group to achieve speeds up to 64 Gbps (128 Gbps full duplex) for optimal bandwidth utilization and load balancing. For more information about Brocade ISL Trunking, see the *Fabric OS Administrator's Guide*.

Chapter

PowerConnect B-8000 Operation 3

In this chapter

- Powering the PowerConnect B-8000 on and off 15
- LED activity interpretation 15
- POST and boot specifications 19
- Interpreting POST results 20
- PowerConnect B-8000 Maintenance 20
- PowerConnect B-8000 Management 22

Powering the PowerConnect B-8000 on and off

Complete the following steps to power the PowerConnect B-8000 on.

1. Connect one or both power cords to the power connectors on the power supplies and to a power source
2. Set the AC power switches to “I”.

   Power is supplied to the switch as soon as the first power supply is connected and powered on.

   The switch runs POST by default each time it is powered on; it can take up to several minutes to boot and complete POST.

To power the PowerConnect B-8000 off, power off both power supplies by setting each AC power switch to “O”. All devices are returned to their initial state the next time the switch is powered on.

LED activity interpretation

System activity and status can be determined through the activity of the LEDs on the switch.

There are three possible LED states: no light, a steady light, and a flashing light. Flashing lights may be slow, fast, or flickering. The lights are green or amber.

Sometimes, the LEDs flash either of the colors during boot, POST, or other diagnostic tests. This is normal; it does not indicate a problem unless the LEDs do not indicate a healthy state after all boot processes and diagnostic tests are complete.

PowerConnect B-8000 LEDs

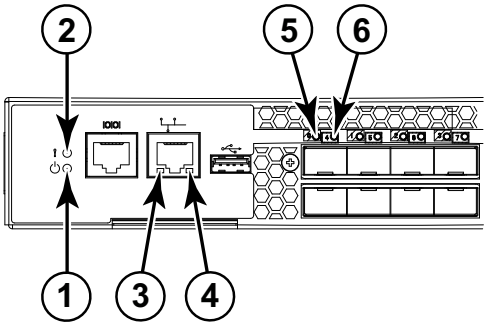
The PowerConnect B-8000 has the following LEDs:

- One system status LED (above) on the left side.
- One power status LED (below) on the left side.

- Two Ethernet Port LEDs (one green and one amber)
- One bicolor (green/amber) port status LED for each port on the switch. These LEDs are arrayed above each pair of Ethernet or Fibre Channel ports. The port LEDs are located in the array in the same relative positions as the ports.
- One power supply LED above the AC power switch on each power supply on the non-port side of the switch
- One fan status LED at the bottom of each fan assembly on the non-port side of the switch

LED locations

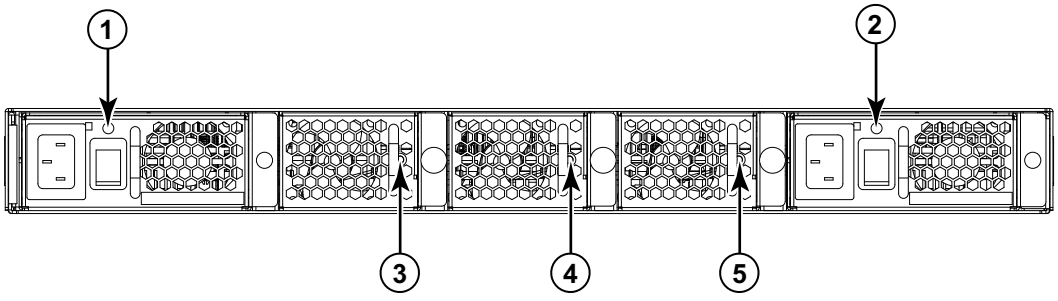
Figure 3 shows the port side of the PowerConnect B-8000. The port status LEDs for both the GbE and FC ports are vertically staggered to correspond to the upper and lower ports in each pair. Refer to Figure 1 for the locations of the GbE and FC ports.



1	System power LED	4	Ethernet link LED
2	System status LED	5	GbE port status LED (port 0)
3	Ethernet speed LED	6	GbE port status LED (port 4)

FIGURE 3 LEDs on Port Side of PowerConnect B-8000

Figure 4 shows the LEDs on the non-port side of the switch.



1	Power supply #2 status LED	4	Fan assembly #2 status LED
2	Power supply #1 status LED	5	Fan assembly #1 status LED
3	Fan assembly #3 status LED		

FIGURE 4 LEDs on non-port side of PowerConnect B-8000

LED patterns

Table 1 describes the port side LEDs and their behavior.

TABLE 1 Port side LED patterns during normal operation

LED name	LED color	Status of hardware	Recommended action
Power Status	No light	System is off or there is an internal power supply failure.	Verify the system is powered on (power supply switches to “1”), the power cables attached, and your power source is live. If the system power LED is not green, the unit may be faulty. Contact your switch service provider.
	Steady green	System is on and power supplies are functioning properly.	No action required.
System Status	No light	System is off or there is no power.	Verify the system is on and has completed booting.
	Steady green	System is on and functioning properly.	No action required.
	Steady amber (for more than five seconds)	Unknown state, boot failed, or the system is faulty. This LED displays steady amber during POST, this is normal and does not indicate a fault.	Perform the following steps: Connect a serial cable to the system. Reboot the system. Check the failure indicated on the system console. Contact your switch service provider.
	Flashing amber	Attention is required. A number of variables can cause this status including a single power supply failure, a fan failure, or one or more environmental ranges has been exceeded.	Check the management interface and the error log for details on the cause of status. Contact your switch service provider.
Ethernet Speed (Management port)	No light	Port speed is 10 Mbps.	No action required.
	Steady green	Port speed is 100/1000 Mbps.	No action required.
Ethernet Activity/Link (Management port)	No light	There is no link.	Verify that the Ethernet cable is connected correctly.
	Steady green	There is a link.	No action required.
	Blinking green	There is link activity (traffic).	No action required.

TABLE 1 Port side LED patterns during normal operation (Continued)

LED name	LED color	Status of hardware	Recommended action
Optical media port status (bi-color LED for each FC and CEE port)	Off	No light or signal carrier on media interface.	Verify that the transceiver is installed correctly and that the cable is connected correctly.
	Steady amber	Receiving light or carrier, but not online.	No action required.
	Slow blinking amber (2 sec)	Disabled (by diagnostics or by portDisable command).	Verify that the diagnostic tests are not being run. Reenable the port using the portEnable command.
	Fast blinking amber (1/2 sec)	Port failure.	Check the management interface and the error log for details on the cause of the failure. Contact Technical Support if necessary.
	Steady green	Online.	No action required.
	Slow blinking green (2 sec)	Online but segmented (loopback cable or incompatible switch).	No action required.
	Fast blinking green (1/2 sec)	Internal loop-back (diagnostic).	No action required.
	Flickering green	Online, frames flowing through port.	No action required.

Table 2 describes the LEDs on the non-port side of the switch.

TABLE 2 Non-port side LED patterns during normal operation

LED name	LED color	Status of hardware	Recommended action
Power Supply Status	No light	Power supply is not receiving power or is off.	Verify the power supply is on and seated and the power cord is connected to a functioning power source.
	Steady green	Power supply is operating normally.	No action required.
	Steady amber (for more than 5 seconds)	Power supply is faulty. **Note:** When the switch is first powered on the power supply status LED will show amber until POST has completed.	Try the following: Check the power cable connection. Verify that the power supply is powered on. Replace the power supply FRU.

TABLE 2 Non-port side LED patterns during normal operation (Continued)

LED name	LED color	Status of hardware	Recommended action
Fan Status	No light	Fan assembly is not receiving power.	Try the following: Verify the fan FRU is seated correctly. Verify the switch is powered on.
	Steady green	Fan assembly is operating normally.	No action required.
	Steady amber (for more than 5 seconds)	Fan fault for one of the following reasons: One or more of the fan(s) in the fan assembly has failed The fan FRU was disabled by the user **Note:** When the switch is first powered on the fan status LED will show amber until POST has completed.	Try the following: Verify the fan FRU is enabled (use the **fanEnable** command). Replace the fan FRU.

POST and boot specifications

When the switch is turned on or rebooted, the switch performs POST. Total boot time with POST can be several minutes. POST can be omitted after subsequent reboots by using the **fastboot** command or entering the **diagDisablePost** command to persistently disable POST.

For more information about these commands, refer to the *Fabric OS Command Reference Manual*.

POST

The success or failure results of the diagnostic tests that run during POST can be monitored through LED activity, the error log, or the command line interface.

POST includes the following tasks:

1. Conducts preliminary POST diagnostics.
2. Initializes the operating system.
3. Initializes hardware.
4. Runs diagnostic tests on several functions, including circuitry, port functionality, memory, statistics counters, and serialization.

Boot

In addition to POST, boot includes the following tasks after POST is complete:

1. Performs universal port configuration.
2. Initializes links.
3. Analyzes fabric. If any ports are connected to other switches, the switch participates in a fabric configuration.
4. Obtains a domain ID and assigns port addresses.

5. Constructs unicast routing tables.
6. Enables normal port operation.

Interpreting POST results

POST is a system check that is performed each time the switch is powered on, rebooted, or reset. During POST, the LEDs flash either amber or green. Any errors that occur during POST are listed in the error log.

Complete the following steps to determine whether POST completed successfully and whether any errors were detected.

1. Verify that the switch LEDs indicate that all components are healthy.

   See Table 1 and Table 2 for descriptions and interpretations of LED patterns. If one or more LEDs do not display a healthy state, verify that the LEDs on the switch are not set to “beacon” by entering the **switchShow** command to detect if beaconing is active.

2. Verify that the switch prompt displays on the terminal of a computer workstation connected to the switch.

   If there is no switch prompt when POST completes, press **Enter**. If the switch prompt still does not display, try opening a Telnet session or accessing the switch through another management tool. If this is not successful, the switch did not successfully complete POST. Contact your switch supplier for repair.

3. Review the switch system log for errors. Any errors detected during POST are written to the system log, accessible through the **errShow** command.

For information about all referenced commands, and on accessing the error log, refer to the *Fabric OS Administrator’s Guide*. For information about error messages, refer to the *Fabric OS Message Reference Manual*.

PowerConnect B-8000 Maintenance

The PowerConnect B-8000 is designed for high availability and low failure; it does not require any regular physical maintenance. It includes diagnostic tests and field-replaceable units, described in the following sections.

Installing an SFP or SFP+

The PowerConnect B-8000 only supports Brocade-branded SFP and SFP+ optical transceivers. For the Fibre Channel connections, the PowerConnect B-8000 uses SFP and SFP+ transceivers that support any combination of Short Wavelength (SWL) and Long Wavelength (LWL) optical media. For its CEE connections, the PowerConnect B-8000 uses SFP+ transceivers that support either optical or Brocade-branded active twinax copper cables. The optical SFP+ transceivers support both SR (Short Reach) and LR (Long Reach) modules. Twinax cables support distances of 1 meter, 3 meters, and 5 meters.

If you use an unqualified transceiver, the **switchShow** command output (for the FC ports) shows the port in a Mod_Inv state. Fabric OS also logs the issue in the system error log. For the GbE ports, use the **cmsh** command.

Complete the following steps to install an SFP or SFP+.

1. Making sure that the bail (wire handle) is in the unlocked position, place the SFP/SFP+ in the correctly oriented position on the port, as shown in Figure 5.
2. Slide the SFP/SFP+ into the port until you feel it click into place; then close the bail.

NOTE
Each SFP/SFP+ has a 10-pad gold-plated PCB-edge connector on the bottom. The correct position to insert an SFP/SFP+ into the upper row of ports is with the gold edge down. The correct position to insert an SFP/SFP+ into the lower row of ports is with the gold edge up.

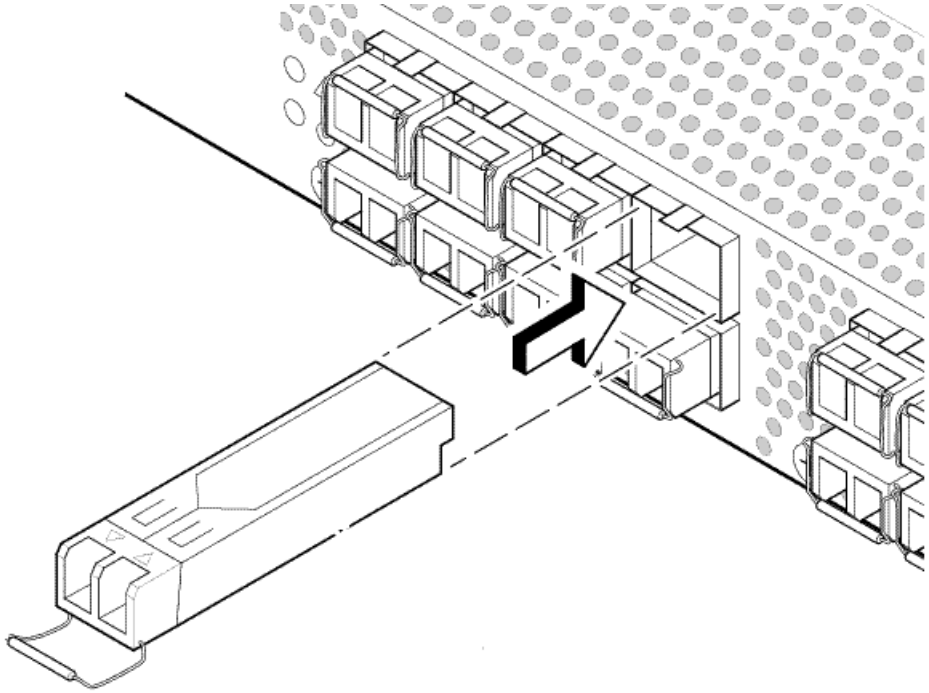


FIGURE 5 Installing an SFP/SFP+ in the upper row of port slot

Diagnostic tests

In addition to POST, Fabric OS includes diagnostic tests to help you troubleshoot the hardware and firmware. This includes tests of internal connections and circuitry, fixed media, and the transceivers and cables in use.

The tests are implemented by command, either through a Telnet session or through a console set up to the serial connection to the switch. Some tests require the ports to be connected by external cables, to allow diagnostics to verify the serializer/deserializer interface, transceiver, and cable. Some tests require loopback plugs.

Diagnostic tests run at link speeds of 1, 2, 4 and 8 Gbps (FC) or 10 Gbps (CEE) depending on the speed of the link being tested and the type of port.

NOTE
Diagnostic tests might temporarily lock the transmit and receive speed of the links during diagnostic testing.

For information about specific diagnostic tests, see the *Fabric OS Troubleshooting and Diagnostics Guide*.

Upgrade

If an existing PowerConnect B-8000 running under Fabric OS v6.1.2_cee is upgraded to Fabric OS v6.3.0, an FC Ports on Demand license is required to enable the Fibre Channel functionality. Failure to do so will result in loss of FC functionality.

PowerConnect B-8000 Management

You can use the management functions built into the PowerConnect B-8000 to monitor the fabric topology, port status, physical status, and other information to help you analyze switch performance and to accelerate system debugging.

The PowerConnect B-8000 automatically performs power-on self-test (POST) each time it is turned on. Any errors are recorded in the system error log. For more information about POST, see "POST and boot specifications" on page 19.

For information about upgrading the version of Fabric OS installed on your switch, see the *Fabric OS Administrator's Guide.*

You can manage the PowerConnect B-8000 using any of the management options listed in Table 3. Note that if you use the command line interface, there are two sets of CLI commands, one for the Fibre Channel features and one for the Converged Enhanced Ethernet (CEE) features. Please refer to the *Fabric OS Command Reference Manual* or the *Converged Enhanced Ethernet Reference* for more information on the respective CLI commands.

TABLE 3 Management Options for the PowerConnect B-8000 Switch

Management Tool	Out-of-band Support	In-band Support
Command line interface (CLI) Up to two admin sessions and four user sessions simultaneously. For more information, refer to the *Fabric OS Administrator's Guide*, *Fabric OS Command Reference Manual*, and the *Converged Enhanced Ethernet Command Reference*.	Ethernet or serial connection	IP over Fibre Channel
Brocade Web Tools For information, refer to the *Web Tools Administrator's Guide*.	Ethernet or serial connection	IP over Fibre Channel
Standard SNMP applications For information, refer to the *MIB Reference Manual*.	Ethernet or serial connection	IP over Fibre Channel
Management Server For information, refer to the *Fabric OS Administrator's Guide* and the *Fabric OS Command Reference Manual*.	Ethernet or serial connection	Native in-band interface (over HBA only)
DCFM (option to purchase) For information, refer to the DCFM documentation set.	Ethernet or serial connection	IP over Fibre Channel

NOTE
To achieve in-band support for IP over Fibre Channel, the software must be run on both the HBA and the switch, and it must be supported by both the HBA and HBA driver.

Chapter

4

Removal and Replacement Procedures (RRPs)

In this chapter

- RRP: Power supply 25
- RRP: Fan assembly 28

Introduction

NOTE
Read the "Installation and safety considerations" before servicing.

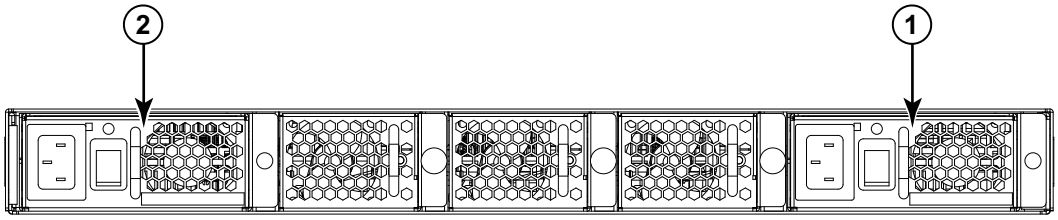
The field replaceable units (FRUs) in the Powerconnect B-8000 can be removed and replaced without special tools. The PowerConnect B-8000 can continue operating during many of the FRU replacements if the conditions specified in the procedure are followed.

The following sections contain FRU removal and replacement procedures (RRPs).

RRP: Power supply

The PowerConnect B-8000 has two power supplies, as displayed in Figure 6. Fabric OS identifies the power supplies from right to left on the non-port side as power supply 1 and power supply 2. (The actual appearance of the PowerConnect B-8000 may differ from this illustration but the locations are correct.)

FIGURE 6 Switch power supplies on the non-port side



1 Power supply 1 2 Power supply 2

CAUTION
Disassembling any part of the power supply voids the part warranty and regulatory certifications. There are no user-serviceable parts inside the power supply. The cooling system relies on pressurized air, do not leave either of the power supply slots empty longer than two minutes when

the PowerConnect B-8000 is operating. If a power supply fails, leave the power supply in the PowerConnect B-8000 until it can be replaced. Maintain both power supplies in operational condition to provide redundancy.

Table 4 describes the power supply status LED colors, behaviors, and actions required, if any.

TABLE 4 Power supply status LED behavior, description, and required actions

LED Color	Description	Action Required
No light	Power supply is not receiving power, or is off.	Verify that the power supply is on and seated and the power cord is connected to a functioning power source.
Steady green	Power supply is operating normally.	No action is required.
Steady amber (for more than 5 seconds)	Power supply fault for one of the following reasons: • The power supply is switched off - amber for ~ 5 seconds, then off • The power cable is disconnected - amber for ~ 5 seconds, then off • The power supply has failed NOTE: When the PowerConnect B-8000 is first powered on, the power supply status LED will show amber until POST has completed.	Try one of the following: • Check the power cable connection. • Verify that the power supply is powered on • Replace the power supply FRU.

Determining the need to replace a power supply

Use one of the following methods to determine the status of the power supplies:

- Check the power supply status LED next to the On/Off switch (see "LED locations" on page 16)
- In Web Tools, click the **Power Status** icon.
- Enter the **psShow** command at the prompt to display power supply status as shown below:

```
br5300:admin> psshow

Power Supply #1 is OK
V10529,    TQ2H0000030     ,60-0300031-01,X2,     ,SP640
,2X,TQ2H0000
Power Supply #2 is OK
V10541,    TQ2H0000189     ,60-0300031-01,X3,     ,SP640-2P        ,A
,TQ2H0000
br5300:admin>
```

Time Required

Replacing a power supply in the PowerConnect B-8000 should require less than two minutes to complete.

Items Required

The following items are required to replace a power supply:

- New power supply
- Phillips-head screwdriver #1

Replacing a Power Supply

To replace a power supply unit in the PowerConnect B-8000 complete the following steps.

1. To leave the PowerConnect B-8000 in service while replacing a power supply, verify that the other power supply (the one not being replaced) has been powered on for at least four seconds and has a steady green LED.
2. Power off the power supply by pressing the AC power switch to the “0” symbol. See Figure 7 for the location of the AC power switch.
3. Unplug the power cord from the power supply that is being replaced.
4. Using a Phillips-head screwdriver, unscrew the captive screw on the power supply.
5. Remove the power supply from the chassis by pulling the handle on the power supply out, away from the chassis.
6. Install the new power supply in the chassis:

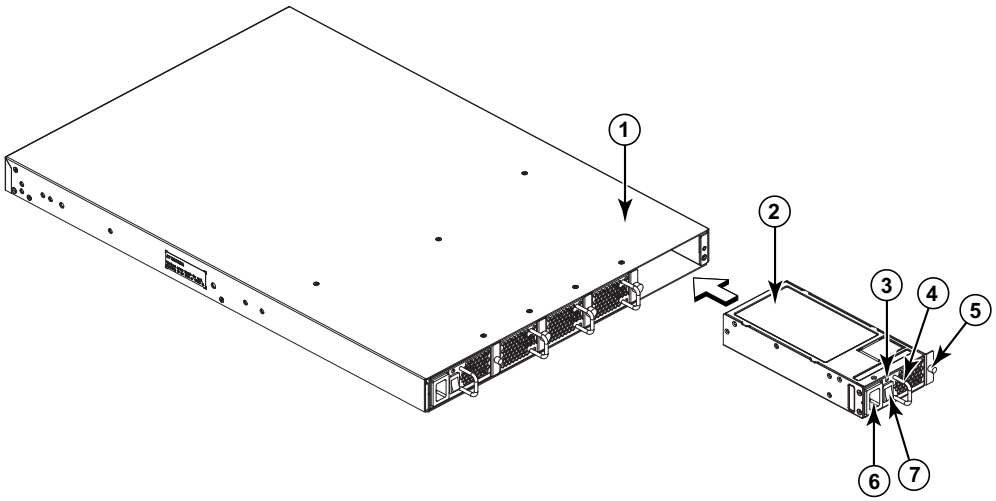
CAUTION

Do not force the installation. If the power supply does not slide in easily, ensure that the power supply is correctly oriented before continuing.

   a. Orient the power supply as shown in Figure 7, with the AC power switch on the left. (The actual appearance of the PowerConnect B-8000 may differ from this illustration but the locations are correct.)
   b. Gently push the power supply into the chassis until it is firmly seated.
   c. Secure the power supply to the chassis by screwing in the captive screw using the Phillips-head screwdriver.
7. Plug the power cord in to the power supply and power on the unit by pressing the AC power switch to the “1” symbol.
8. Verify that the LED on the new power supply displays a steady green light while the PowerConnect B-8000 is operating (see Table 4). If the LED is not a steady green, ensure that the power supply is securely installed and seated properly.

9. Optionally, if using the Command Line Interface (CLI), enter the **psShow** command at the command line prompt to display power supply status. Power supply status can also be viewed using the Web Tools application. See Figure 6 for the location of power supply 1 and power supply 2.

FIGURE 7 Inserting the power supply in the Switch

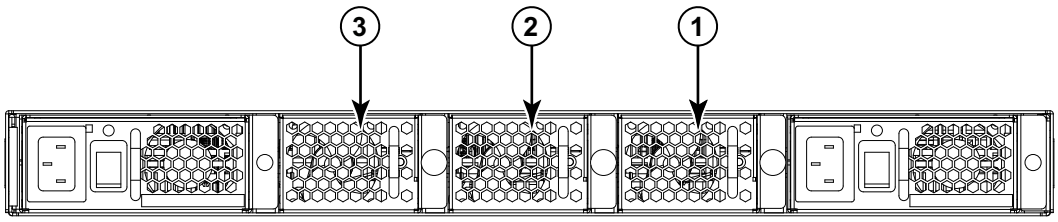


1	PowerConnect B-8000 chassis	5	Captive screw
2	Power supply	6	AC Power receptacle
3	Status LED	7	AC power switch
4	Handle		

RRP: Fan assembly

The PowerConnect B-8000 has three fan assemblies as displayed in Figure 8. Fabric OS identifies the fan locations.

FIGURE 8 PowerConnect B-8000 fan assemblies on the non-port side



1	Fan Assembly 1	2	Fan Assembly 2
3	Fan Assembly 3		

CAUTION

Disassembling any part of the fan assembly voids the part warranty and regulatory certifications. There are no user-serviceable parts inside the fan assembly.

Because the cooling system relies on pressurized air, do not leave any of the fan assembly slots empty longer than two minutes while the switch is operating. If a fan assembly fails, leave it in the switch until it can be replaced.

Maintain all three fan assemblies in operational condition to provide redundancy.

Table 5 describes the fan status LED colors, behaviors, and actions required, if any

TABLE 5 Fan status LED behavior, description, and required actions.

LED Color and behavior	Description	Action Required
No light	Fan assembly is not receiving power.	Verify that the fan FRU is seated correctly.
Steady green	Fan assembly is operating normally.	No action required.
Steady amber (for more than 5 seconds)	Fan fault for one of the following reasons: • One or more of the fans in the fan assembly has failed. • The fan FRU was disabled by the user.	Verify that the fan FRU is enabled. If the fan FRU is enabled and the FRU is faulty, it should be replaced.

Determining the need to replace a fan assembly

Use one of the following methods:

- Check the fan status LED on the face of the fan assembly (see "LED locations" on page 16).
- In Web Tools, click the **Fan Status** icon.
- Enter the **fanShow** command at the prompt:

```
br5300:admin> fanshow
Fan 1 is Ok, speed is 4821 RPM
Fan 2 is Ok, speed is 4821 RPM
Fan 3 is Ok, speed is 4891 RPM
br5300:admin>
```

Time required

Replacing a fan assembly in the PowerConnect B-8000 should require less than two minutes to complete.

Items required

The following items are required to replace a fan assembly in the PowerConnect B-8000:

- New fan assembly
- Phillips-head screwdriver #1

Replacing a PowerConnect B-8000 fan assembly

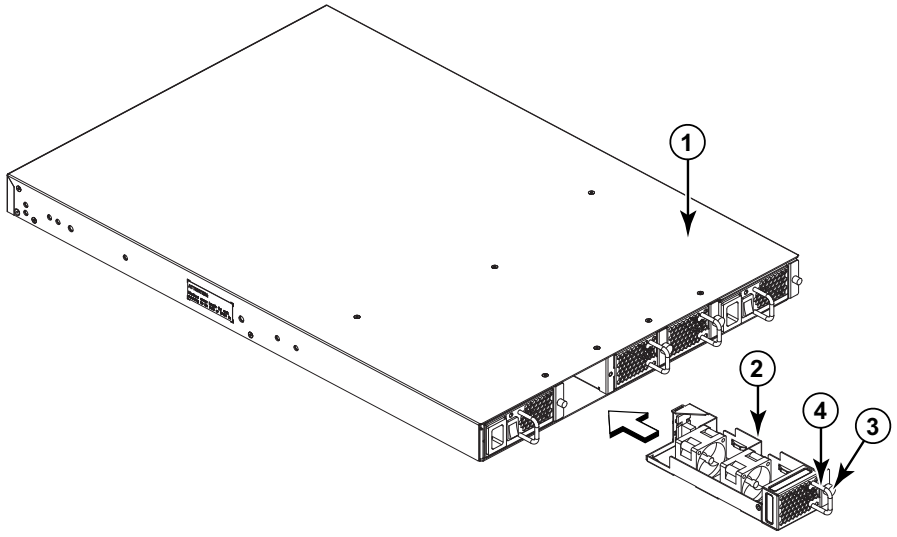
To replace a fan assembly in the PowerConnect B-8000, complete the following steps.

1. With a Phillips-head screwdriver, unscrew the captive screw on the fan assembly.
2. Pull the fan assembly out by the handle, away from the chassis.
3. Install the new fan assembly in the chassis:
   a. Orient the new fan assembly as shown in Figure 9, with the captive screw on the right.
   b. Gently push the fan assembly into the chassis until it is firmly seated.

   NOTE
   Do not force the installation. If the fan assembly does not slide in easily, ensure that it is correctly oriented before continuing.

   c. Using the Phillips-head screwdriver, secure the fan assembly to the chassis by tightening in the captive screw.
4. Verify that the fan status LED is lit (steady green) to indicate normal operation (see Table 5).
5. Optionally, if using the Command Line Interface (CLI), display the fan status using the **fanShow** command from the command line. The fan status can be also be viewed using the Web Tools application. See Figure 8 for the locations of the fan assemblies.

FIGURE 9 Inserting the fan assembly in the PowerConnect B-8000



1	PowerConnect B-8000 chassis	3	Captive Screw
2	Fan Assembly	4	Handle

Appendix

PowerConnect B-8000 Specifications

A

In this appendix

- Switch components 31
- Weight and physical dimensions 32
- Facility requirements 32
- Power supply specifications 32
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- Data transmission ranges 34
- Fabric latency 35
- Memory specifications 35
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Switch components

The PowerConnect B-8000 switch includes the following components:

- Cabinet-mountable 1U chassis designed to be mounted in a 19-in. cabinet space, with forced-air cooling that flows from the non-port side of the switch to the port side.
- 8 Fibre Channel ports, compatible with short wavelength (SWL) and long wavelength (LWL) SFP and SFP+ Fibre Channel transceivers. Brocade-branded SFP+ transceivers are required for 8 Gbps performance.
- 24 CEE ports, compatible with both Short Reach (SR) and Long Reach (LR) SFP+ 10 GE transceivers.
- IEEE-compliant RJ45 connectors on the port side of the switch for use with a serial console and 10/100/1000 MB Ethernet.
- 32 port Link LEDs, one switch power LED, one switch status LED, two Ethernet LEDs, two power supply LEDs, and three fan LEDs.
- 2 universal AC power supplies with AC switches and built-in fans.
- 3 fan assemblies containing two fans each. The fans have two speeds, which are set automatically and cannot be modified. They default to high speed upon boot, then switch to low speed as Fabric OS comes online, returning to high speed only as required.

Weight and physical dimensions

Table 6 lists the weight and dimensions of the PowerConnect B-8000.

TABLE 6 Physical specifications

Dimension	Value
Height	1U or 4.3 cm (1.7 in.)
Depth	63.4 cm (25 in.)
Width	42.8 cm (16.8 in.)
Weight (with two power supplies, three fan assemblies, and no SFPs installed)	12.97 kg (28.6 lb)

Facility requirements

Table 7 provides the facilities requirements that must be met for the PowerConnect B-8000.

TABLE 7 Facility Requirements

Type	Requirements
Electrical	• Primary AC input 100-240 VAC, 2.0A, 47-63 Hz; switch autosenses input voltage • Adequate supply circuit, line fusing, and wire size, as specified by the electrical rating on the switch nameplate • Circuit protected by a circuit breaker and grounded in accordance with local electrical codes Refer to Table 8 on page 32 for complete power supply specifications.
Thermal	• A minimum air flow of 79.8 cubic meters/hour (47 cubic ft/min.) available in the immediate vicinity of the switch • Ambient air temperature not exceeding 40° C (104° F) while the switch is operating
Cabinet (when rack-mounted)	• One rack unit (1U) in a 48.3 cm (19-inch) cabinet • All equipment in cabinet grounded through a reliable branch circuit connection • Additional weight of switch not to exceed the cabinet's weight limits • Cabinet secured to ensure stability in case of unexpected movement

Power supply specifications

The power supplies are universal and capable of functioning worldwide without voltage jumpers or switches. They meet IEC 61000-4-5 surge voltage requirements and are autoranging in terms of accommodating input voltages and line frequencies. Each power supply has a built-in fan for cooling, pushing air towards the port side of the switch.

Table 8 lists the power supply specifications for the PowerConnect B-8000.

TABLE 8 Power Supply Specifications

Specification	Value
Maximum output of one power supply	350 watts
System DC power consumption (excluding power supply and fan FRUs)	Idle: 182.4 W Maximum: 306 W

TABLE 8 Power Supply Specifications

Specification	Value
Input system power (including power supply and fan FRUs)	Idle: 206 W Maximum: 306 W
Input voltage	85-264 VAC
Input line frequency	47-63 Hz
BTU rating	1044.11 BTU/hr
Inrush current	Maximum of 60A for period of 10-150mS
Input line protection	Both AC lines are fused

Environmental requirements

Table 9 lists the acceptable environmental ranges for both operating and nonoperating (such as during transportation or storage) conditions.

TABLE 9 Environmental requirements

Condition	Acceptable during operation	Acceptable During Non-Operation
Ambient Temperature	0° to 40° C 32° to 104° F	-25° to 70° C -13° to 158° F
Humidity	10% to 85% RH non-condensing, at 40° C (104° F)	10% to 90% RH non-condensing, at 70° C (158° F)
Altitude	0 to 3 km (9,842 feet) above sea level	0 to 12 km (39,370 feet) above sea level
Shock	20 G, 6 ms, half-sine wave	33 G, 11 ms, half-sine wave, 3/eg Axis
Vibration	0.5 G sine, 0.4 gms random, 5-500 Hz	2.0 G sine, 1.1 gms random, 5-500 Hz
Air flow	Maximum - 71.36 cmh (42 cfm) Nominal - 59.47 cmh (35 cfm)	NA
Heat dissipation	1044 BTU/hr (32 port configuration)	NA

General specifications

Table 10 lists the general specifications for the PowerConnect B-8000.

TABLE 10 General specifications

Specification	Description
Configurable port types	F_Port, FL_Port, E_Port, and M_Port
System architecture	Nonblocking shared-memory switch
System processor	Freescale MPC8548 x 1.3GHz
ANSI Fibre Channel protocol	FC-PH (Fibre Channel Physical and Signalling Interface standard)
Modes of operation	Fibre Channel Class 2 and Class 3
Fabric initialization	Complies with FC-SW-3 Rev. 6.6
FC-IP (IP-over-Fibre Channel)	Complies with FC-IP 2.3 of FCA profile

TABLE 10 General specifications

Specification	Description
Aggregate switch I/O bandwidth	608 Gbps
FC Port-to-port latency	Less than 700 nanoseconds with no contention (destination port is free)
10 GbE Port-to-port latency	Less than 600 nanoseconds on the same ASIC

Data transmission ranges

Table 11 provides the data transmission ranges for different cable types and port speeds for Fibre Channel ports 0-7.

TABLE 11 Laser Data Transmission Range

Port Speed	Cable Size (microns)	Short Wavelength (SWL)	Long Wavelength (LWL)
1 Gbps	50	500 m (1,640 ft) (OM2) 860 m (2,821 ft) (OM3)	NA
	62.5	300 m (984 ft)	NA
	9	NA	10 km (6.2 miles)
2 Gbps	50	300 m (984 ft) (OM2) 500 m (1,640 ft) (OM3)	NA
	62.5	150 m (492 ft)	NA
	9	NA	10 km (6.2 miles)
4 Gbps	50	150 m (492 ft) (OM2) 380 m (1,246 ft) (OM3)	NA
	62.5	70 m (230 ft)	NA
	9	NA	10 km (6.2 miles)
8 Gbps	50	50 m (164 ft) (OM2) 150 m (492 ft) (OM3)	NA
	62.5	21 m (69 ft)	NA
	9	NA	10 km (6.2 miles)

Up to 500 km at 1G is supported when using long distance transport system such as DWDM.

Fabric latency

The PowerConnect B-8000 supports several types of interfaces. Table 12 shows the latency for different types of data flow.

TABLE 12 PowerConnect B-8000 data flow latency

Type	Size
FC port to FC port	~700 ns
CEE port to CEE port (same ASIC)	570 ns
CEE port to CEE port (different ASIC)	1050 ns
FCoE to FC	1670 ns

Memory specifications

The PowerConnect B-8000 has three types of memory devices, boot flash, compact flash, and main memory. The size of each is listed in the following table.

TABLE 13 PowerConnect B-8000 memory specifications

Type	Size
Boot flash	4 MB
Compact flash	1 GB
Main memory (DDR2 SDRAM)	1 GB

Fibre Channel port specifications

The Fibre Channel ports in the PowerConnect B-8000 are compatible with SWL and LWL SFP and SFP+ (for 8 Gbps performance) transceivers. The strength of the signal is determined by the type of transceiver in use.

The ports meet all required safety standards. For more information about these standards, see "Regulatory compliance" on page 36.

The ports are capable of operating at 1, 2, 4, or 8 Gbps and are able to autonegotiate to the maximum link speed.

Serial port specifications

The serial port is located on the port side of the switch. The PowerConnect B-8000 uses an RJ45 connector for the serial port. An RJ45 to DB9 adaptor cable is also provided with the switch.

NOTE
To protect the serial port from damage, keep the cover on the port when not in use.

The serial port can be used to connect to a workstation to configure the switch IP address before connecting the switch to a fabric or IP network. The serial port's parameters are fixed at 9600 baud, 8 data bits, and no parity, with flow control set to None.

Table 14 lists the serial cable pinouts.

TABLE 14 Serial cable pinouts

PIN	Signal	Description
1	Not supported	NA
2	Not supported	NA
3	UART1_TXD	Transmit data
4	GND	Logic ground
5	GND	Logic ground
6	UART1_RXD	Receive data
7	Not supported	NA
8	Not supported	NA

Regulatory compliance

This section describes the regulatory compliance requirements for the PowerConnect B-8000. It contains:

- "FCC warning (US only)," next
- "KCC statement (Republic of Korea)" on page 37
- "VCCI statement Japan" on page 37
- "Power cords (Japan Denan)" on page 37
- "BSMI statement (Taiwan)" on page 37
- "CE statement" on page 37
- "Canadian requirements" on page 38
- "Laser compliance" on page 38
- "RTC battery" on page 38
- "Electrical safety" on page 38

FCC warning (US only)

This equipment has been tested and complies with the limits for a Class A computing device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual, might cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at the user's own expense.

KCC statement (Republic of Korea)

사용자 안내문 : A 급기기

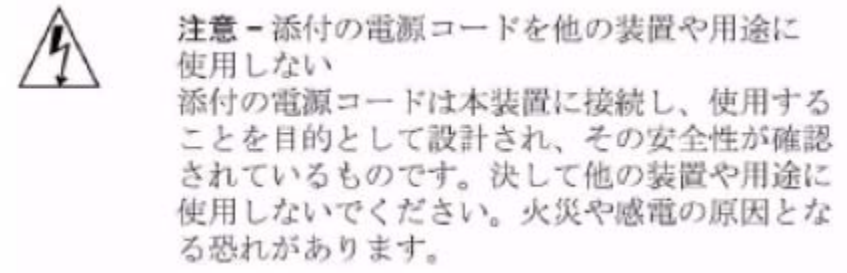
이 기기는 업무용으로 전자파 적합 등록을 받은 기기
이오니, 판매자 또는 사용자는 이점을 주의하시기
바라며, 만약 잘못 구입하셨을 때에는 구입한 곳에
서 비업무용으로 교환하시기 바랍니다.

VCCI statement Japan

This is a Class A product based on the standard of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio disturbance might arise. When such trouble occurs, the user might be required to take corrective actions.

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラス A 情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるように要求されることがあります。

Power cords (Japan Denan)



BSMI statement (Taiwan)

The BSMI Statement is applicable to PowerConnect B-8000 power supplies.

警告使用者：
這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，
在這種情況下，使用者會被要求採取某些適當的對策。

CE statement

ATTENTION
This is a Class A product. In a domestic environment, this product might cause radio interference, and the user might be required to take corrective measures

The standards compliance label on the PowerConnect B-8000 contains the CE mark which indicates that this system conforms to the provisions of the following European Council directives, laws, and standards:

- Electromagnetic Compatibility (EMC) Directive 2004/108/EEC
- Low Voltage Directive (LVD) 2006/95/EC
- EN50082-2/EN55024:1998 (European Immunity Requirements)
  - EN61000-3-2/JEIDA (European and Japanese Harmonics Spec)
  - EN61000-3-3

Canadian requirements

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations, ICES-003 Class A.

Laser compliance

This equipment contains Class 1 laser products and complies with FDA Radiation Performance Standards, 21 CFR Subchapter I and the international laser safety standard IEC 825-2.

ATTENTION
Use only optical transceivers that are qualified by Brocade Communications Systems, Inc. and comply with the FDA Class 1 radiation performance requirements defined in 21 CFR Subchapter I, and with IEC 825-2. Optical products that do not comply with these standards might emit light that is hazardous to the eyes.

RTC battery

CAUTION
Do not attempt to replace the real-time clock (RTC) battery. There is danger of explosion if the battery is incorrectly replaced or disposed of. Contact your switch supplier if the real-time clock begins to lose time.

Electrical safety

CAUTION
This switch might have more than one power cord. To reduce the risk of electric shock, disconnect both power cords before servicing.

CAUTION

Connect the power cord only to a grounded outlet.

CAUTION

This product is designed for an IT power system with phase-to-phase voltage of 230V. After operation of the protective device, the equipment is still under voltage if it is connected to an IT power system.

Regulatory certifications

Table 15 lists the regulatory compliance standards for which the PowerConnect B-8000 is certified.

TABLE 15 Regulatory compliance standards

Country	Standards		Agency Certifications and Markings	
	Safety	EMC	Safety	EMC
United States	Bi-Nat UL/CSA 60950-1 1st Ed or latest	ANSI C63.4	cCSAus	FCC Class A and Statement
Canada	Bi-Nat UL/CSA 60950-1 1st Ed or latest	ICES-003 Class A	cCSAus	ICES A and Statement
Japan		CISPR22 and JEIDA (Harmonics)		VCCI-A and Statement
European Union	EN60950-1 or latest	EN55022 and EN55024	TUV-GS, N	CE marking
Australia, New Zealand		EN55022 and CISPR22 or AS/NZS CISPR22		C-Tick mark
Argentina	IEC60950-1 or latest		“S” mark	
Russia	IEC60950-1 or latest	51318.22-99 and 51318.24.99 or latest	GOST mark	GOST mark
Korea		KN22 and KN24		KCC mark Class A
China (PS only)	GB4943-2001 and GB9254-1998 or latest	GB17625.1-2003 or latest	CCC logo	CCC logo
Taiwan (PS only)	CNS 14336(94) or latest	CNS 13438(95) or latest	BSMI mark	BSMI mark

Environmental regulation compliance

This section describes the "China RoHS" environmental regulatory compliance requirements for the PowerConnect B-8000 switch.

China RoHS

The contents included in this section are per the requirements of the People's Republic of China-Management Methods for Controlling Pollution by Electronic Information products.

遵守环境法规
中国 **RoHS**
本节中包含的内容都遵守了中华人民共和国《电子信息产品污染控制管理办法》的要求。

Environmental protection use period (EPUP) disclaimer

In no event do the EPUP logos shown on the product and FRUs alter or expand that warranty that Brocade provides with respect to its products as set forth in the applicable contract between Brocade and its customer. Brocade hereby disclaims all other warranties and representations with respect to the information contained on this CD including the implied warranties of merchantability, fitness for a particular purposes and non-infringement.

The EPUP assumes that the product will be used under normal conditions in accordance with the operating manual of the product.

环保使用期限 **(EPUP)** 免责声明：
EPUP 标志不会出现在产品和 FRU 的改装产品中，也不会对 Brocade 所提供的相关产品保修条款（该保修条款在 Brocade 及其客户间达成的适用合同中列出）进行增补。对于此 CD 上包含的相关信息，如适销性、针对特定用途的适用性和非侵权性的暗示保证，Brocade 在此郑重声明本公司对于与上述信息相关的所有其他保证和陈述概不负责。EPUP 假设在“产品操作手册”中注明的常规条件下使用该产品。

TS/HS dual language sheet

In accordance with China's Management Measures on the Control of Pollution caused by Electronic Information products (Decree No. 39 by the Ministry of Information Industry), the following information is provided regarding the names and concentration level of Hazardous substances (HS) which may be contained in this product.

TABLE 16 China ROHS hazardous substances/toxic substances (HS/TS) concentration chart

Name of the Component	Hazardous/Toxic Substance/Elements					
	Lead (PB)	Mercury (Hg)	Cadium (CD)	Hexavalent Chromium (CR6+)	Polybrominated Biphenyl (PBB)	Polybrominated Diphenyl Ether (PBDE)
Fibre Channel Switch	X	O	O	O	O	O
Fan, Blower assemblies	X	O	O	O	O	O
PCBA cards	X	O	O	O	O	O
Power Supply kit	X	O	O	O	O	O
SFPs (SFP+ optical cable connectors)	X	O	O	O	O	O
Sheet Metal	X	O	O	O	O	O
Chassis Assembly	X	O	O	O	O	O
Mechanical brackets and Slides	X	O	O	O	O	O
Slot Filler	X	O	O	O	O	O
Cable management tray	X	O	O	O	O	O
Cable Comb	O	O	O	O	O	O
Cables and power cords	O	O	O	O	O	O
Replacement Doors	X	O	O	O	O	O
Software/ Documentation CDs	O	O	O	O	O	O

X indicates that the concentration of such hazardous/toxic substance in all the units of homogeneous material of such component is higher than the SJ/T11363-2006 Requirements for Concentration Limits.

O indicates that no such substances are used or that the concentration is within the aforementioned limits.

CHINA ROHS 有害物质/有毒物质(HS/TS)限量列表

有毒与有害物质或元素的名称及含量

根据中国的<<电子信息产品污染控制管理办法>>(信息产业部第 39 号令)，本公司提供以下有关产品中可能含有的有害物质(HS)的名称及含量水平的信息。

主要部件名称	有害/有毒物质或元素					
	铅（Pb）	汞（Hg）	镉（Cd）	六价铬（CR6+）	多溴联苯（PBB）	多溴二苯醚（PBDE）
光纤通道交换机	X	O	O	O	O	O
风扇/冷却组装件	X	O	O	O	O	O
线路板部件	X	O	O	O	O	O
USB 闪存器	O	O	O	O	O	O
电源	X	O	O	O	O	O
SFP（光纤接头）	X	O	O	O	O	O
钣金件	X	O	O	O	O	O
机箱部件	X	O	O	O	O	O
机械支架及滑轨	X	O	O	O	O	O
插槽填充物	X	O	O	O	O	O
电缆整理盘	X	O	O	O	O	O
梳状线缆	O	O	O	O	O	O
线束及电源线	O	O	O	O	O	O
替换门	X	O	O	O	O	O
软件/文档光盘	O	O	O	O	O	O

X 表示此类部件内同质材料中的有害/有毒含量高于 SJ/T11363-2006 的限量要求。

O 表示未使用此类物质或其含量低于上述限量要求。

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